DOCUMENT RESUME

ED 079 146 SE 016 534

TITLE	National Clearinghouse for Drug Abuse Information Report Series, Series 16, No. 1.
INSTITUTION	National Inst. of Mental Health, Rockville, Md. National Clearinghouse for Drug Abuse Information.
PUB DATE	May 73
NOTE	15p.
AVAILABLE FROM	National Clearinghouse for Drug Abuse Information, 5600 Fishers Lane, Rockville, Maryland 20852
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	Chemistry; Drug Abuse; *Drug Education; Narcotics; *Reports; *Research; Social Sciences; *Stimulants
IDENTIFIERS	*Psilocybin; Research Reports

ABSTRACT

Concerned with clarifying some of the more complex issues in drug abuse, the National Clearinghouse for Drug Abuse Information has prepared this special report on psilocybin. Background information is provided through a summary of its history, legal status, and the opinions of authorities in the field. Significant research on the subject is presented together with major findings on various aspects of the problem. The pharmacology, chemistry, clinical effects (physiological, psychological, and behavioral), treatment, and patterns of use of the drug are dealt with. Bibliographic references are also listed. (BL)

FILMED FROM BEST AVAILABLE COPY

report series

NATIONAL CLEARINGHOUSE FOR DRUG ABUSE INFORMATION

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

SERIES 16, NO. 1

MAY 1973

ED 079146

The National Clearinghouse for Drug Abuse Information recognized the need for clarifying some of the more complex issues in drug abuse by gathering the significant research on each subject and summarizing the major findings on various aspects of the problem. Report Series 11 through 18 deal with the pharmacology, chemistry, clinical effects, treatment and the patterns of use of each drug and provide a background in the area by outlining the history, legal status and the opinions of authorities in the field. These fact sheets were written and researched by the Student Association for the Study of Hallucinogens (STASH), Beloit, Wisconsin, under Contract No. HSM-42-71-26.

PSILOCYBIN

The plant kingdom has provided man with an abundant source of medicinal and mind-altering substances. Cocaine from the coca plant, opium from the poppy, nicotine from tobacco, and mescaline from the peyote cactus are examples of these drugs. One such drug which has achieved prominence during the psychedelic era is psilocybin. Psilocybin occurs naturally in several species of mushrooms, notably Psilocybe mexicana.

History

Teonanacatl ("food of the gods"), the sacred mushroom, has been used by Indian cultures of Mexico and Central America for centuries. The practice of incorporating a divine mushroom into a semi-religious ceremony dates back to 1500 B.C., based on stone artifacts believed to represent mushrooms. The first recorded use of hallucinogenic mushrooms occurred during the coronation feast of Montezuma in 1502. However, with the introduction of Christianity to the New World, the advocates of the mushroom rites were severely persecuted and the practice was driven underground.

In 1953, R. Gordon Wasson, a New York banker, and his wife, Valentina Pavlovna, rediscovered the ancient ritual of the Oaxacan Indians. The ritual is supervised by a curandero (priestess) and is conducted only when a specific problem arises. (This contrasts with the regular weekly use of peyote by the Native American Church of North America.) The Wassons described the taste of the mushrooms as acidic,

ED 016 534

FILMED FROM BEST AVAILABLE COPY

FILMED FROM BEST AVAILABLE COPY

Subjective Effects.

The subjective experience produced by the hallucinogens, including psilocybin, is largely determined by the individual's set and setting. The set includes the following: the personality of the user; mood; expectations; and preparation (e.g., discussion and reading). The setting involves the environment in which the drug is taken, that is, the degree to which the immediate surroundings are comfortable. This may include such situational factors as music, intensity of light, and presence of friends. The set and setting greatly affect the outcome of the "trip."

In a clinical setting, Dr. Leo E. Hollister described the pattern of subjective effects in normal subjects given doses of 115 to 160 mcg./kg. orally as follows:

FILMED FROM BEST AVAILABLE COPY

FILMED FROM BEST AVAILABLE COPY

FILMED FROM BEST AVAILABLE COPY

FILMED FROM BEST AVAILABLE COPY

Physiological Effects

The physiological effects produced by psilocybin are not unlike those seen with LSD. These effects are usually minimal and tend to be mediated by the autonomic nervous system. Common physiological changes include: pupillary dilation; increased deep tendon reflexes; slight increases in pulse, blood pressure and body temperature.

Hollister (1968) reported that urinary excretion of inorganic phosphorus and total circulating eosinophils were significantly reduced. Hollister also found increased free fatty acid (FFA) levels indicative of stress in fasting subjects given psilocybin, mescaline or LSD. It is difficult to discern whether these biochemical changes are effective monitors of the drug's mode of action, or if these alterations are indicative of anxiety produced by psilocybin.

Treatment

The main dangers associated with psilocybin, as well as the other hallucinogens and marihuana, are primarily psychological in nature. These may be evidenced as intense anxiety or panic states ("bad trips"), depressive or paranoid reactions, mood changes, disorientation and an inability to distinguish between reality and fantasy. Some prolonged psychotic reactions to psychedelic drugs have been reported, particularly with persons already psychologically disturbed.

The "talk-down" technique has been established as the preferred method for handling "bad trips." This technique involves non-moralizing, comforting, personal support from an experienced individual. This is aided by limiting external stimulation such as intense light or loud sounds and having the person lie down and relax.

Although use of tranquilizers (e.g., phenothiazines) is widespread, these drugs should only be employed to "abort" the psychedelic drug experience if "talking down" has failed. Several problems may arise from the use of tranquilizers or other sedatives including: possible undesirable interactions with unknown street drugs or contaminated drugs; creation of a more confusing picture, which is harder for the physician to diagnose and treat; a paradoxical response potentiating the drug effects; and increasing the possibility of subsequent flashbacks (recurrences).

Legal Aspects

Psilocybin and psilocin are considered controlled dangerous substances under the Comprehensive Drug Abuse Prevention and Control Act of 1970. Illegal possession of psilocybin or psilocin (in synthetic or organic form) can result in a sentence to a term of imprisonment of not more than one year, a fine of not more than $5,000, or both. Conviction of illicit manufacture or sale can result in a sentence to a

FILMED FROM BEST AVAILABLE COPY

term of imprisonment of not more than 5 years, a fine of not more than $15,000, or both. Subsequent convictions would result in increased penalties.

Comments

The psychedelic drugs, including psilocybin, have for decades been the subject of extensive scientific research. These drugs have gained further attention by the non-scientific community as substances which "expand consciousness" and which have opened areas of self-investigation previously unrecognized.

> I don't know what psilocybin does for other people, but for me it has been profoundly healing and illuminating.
>
> Alan Watts, D.D.

A determination must be made by the user as to whether the benefits derived from the drug are outweighed by potential detrimental effects.

> The use of psychotomimetic drugs as therapeutic agents in an out-patient setting may prove potentially hazardous. Acute states of excitement, depression with suicidal ideation and impairment of judgment may occur with these drugs, even in the most carefully supervised in-patient setting. With out-patients, the danger of self-administration and inadequate supervision could compound such occurrences.
>
> Sidney Malitz, M.D. et al.

Perhaps, knowledge of the drug's effects and the concomitant non-pharmacological factors may assist in making this assessment.

> LSD and related drugs induce bizarre and often threatening experiences which may be used productively by individuals with well-integrated personalities. On the other hand, they can severely shake an adolescent's already tenuous conception of self, further disrupting a crucial period of psycho-social development.
>
> Samuel Irwin, Ph.D.

FILMED FROM BEST AVAILABLE COPY

REFERENCES

Agurell, S., and Nilsson, L.G. A biosynthetic sequence from tryptophan to psilocybin. Tetrahedron Letters, 9:1063-1064, 1968.

Asuma, H. Psilocybin disorganization. Recent Advances in Biological Psychiatry, 5:184-198, 1963.

Baer, G. Statistical results on reactions of normal subjects to the psilocybin derivatives CEY 19 and CZ 74. In: Brill, H., ed. Neuropsychopharmacology. Amsterdam: Excerpta Medica Foundation, 1967, pp. 400-404.

Barron, F. The relationship of ego diffusion to creative perception. In: Taylor, C.W., ed. Widening Horizons in Creativity. New York: John Wiley and Sons, 1964, pp. 80-86.

Cerletti, A. Pharmacology of psilocybin. In: Bradley, P.B.; Deniker, P.; and Radouco-Thomas, C., eds. Neuropsychopharmacology. Amsterdam: Elsevier, 1959, pp. 291-294.

Cerletti, A., and Hofmann, A. Mushroom and toadstools. Lancet, 1:58-59, January 5, 1963.

DaFonseca, J.S.; Cardoso, C.; Salgueiro, E.; and Fialho, M.L. Neurophysiological and psychological study of psilocybin-induced modifications of visual information processing in man. In: Bente, D., and Bradley, P.B., eds. Neuropsychopharmacology. Amsterdam: Elsevier, 1965, pp. 315-319.

DaFonseca, J.S.; Fialho, M.L.; and Gil, M.T. Evoked potentials and visual information processing under the action of psilocybin in the cat. In: Bente, D., and Bradley, P.B., eds. Neuropsychopharmacology. Amsterdam: Elsevier, 1965, pp. 309-315.

Duke, R.B., and Keeler, M.H. The effects of psilocybin, dextroamphetamine and placebo on performance of the trail making test. Journal of Clinical Psychology, 24:316-317, July, 1968.

Fischer, R. Time contraction and psychomotor performance produced by psilocybin. Nature, 209:433-434, January 22, 1966.

Fischer, R. Sympathetic excitation and biological chronometry. International Journal of Neuropsychiatry, 2:116-121, April, 1966.

Fischer, R. Out on a (phantom) limb. Variations on the theme, stability of body image and the golden section. Perspectives in Biology and Medicine, 12:259-273, 1969.

FILMED FROM BEST AVAILABLE COPY

Fischer, R.; England, S.K.; Archer, R.C., and Dean, W.E. Psilocybin reactivity and time contraction as measured by perceptomotor performance. Arzneimittelforschung, 16:180-185, February, 1966.

Fischer, R.; Hill, R.; Thatcher, R.; and Scheib, U. Electrographic-induced contraction of nearby visual space. Agents and Actions, 1:190-197, 1970.

Fischer, R.; Hill, R.M.; and Wardwell, D. Effects of the psychedelyleptic drug psilocybin on visual perception: Changes in brightness preference. Experientia, 25:166-169, February 15, 1969.

Fischer, R.; Kappeler, T.; Wisecup, P.; and Thatcher, R. Measurement of wandering area to pressure ratios during psilocybin induced hallucinations. Agents and Actions, 1:42-52, 1969.

Fischer, R.; Kappeler, T.; Wisecup, P.; and Thatcher, R. Personality trait dependent performance under psilocybin. Diseases of the Nervous System, 31:91-101, 181-192, February-March, 1970.

Fischer, R., and Rockey, M.A. A heuristic model of creativity. Experientia, 23:150-151, February 15, 1967.

Fischer, R., and Wardwell, D. Psilocybin-induced autonomic, perceptual, and behavioral change. Pharmakopsychiatrie, 1:291-302, November, 1968.

Gibson, L.P., and O'Brien, R.D. Psilocybin: reaction with a fraction of rat brain. Science, 155:207-208, January, 1967.

Heim, R.; Gensser, K.; Hughes, D.W.; and Beley, G. Botanical and chemical characterization of a forensic mushroom specimen of the genus psilocybe. Journal of the Forensic Science Society, 6:192-202, October, 1966.

Hoffer, A., and Osmond, H. The Hallucinogens. New York: Academic Press, 1967.

Hofmann, A. Chemical aspects of psilocybin, the psychotropic principle from the Mexican fungus, Psilocybe mexicana Heim. In: Bradley, P.B.; Deniker, P.; and Radouco-Thomas, C., eds. Neuropsychopharmacology. Amsterdam: Elsevier, 1959, pp. 446-448.

Hollister, L.E. Clinical, biochemical and psychologic effects of psilocybin. Archives Internationales de Pharmacodynamie et de Therapie, 130:42-52, 1961

FILMED FROM BEST AVAILABLE COPY

Hollister, L.E. Chemical Psychoses: LSD and Related Compounds. Springfield, Ill.: C.C. Thomas, 1968.

Hopf, A., and Eckert, H. Autoradiographic studies on the distribution of psychoactive drugs in the rat brain. III. 14C-psilocin. Psychopharmacologia, 16:201-222, 1969.

Horita, A. Some biochemical studies on psilocybin and psilocin. Journal of Neuropsychiatry, 4:270-273, April, 1963.

Horita, A., and Weber, L.J. Dephosphorylation of psilocybin to psilocin by alkaline phosphatase. Proceedings of the Society for Experimental Biology and Medicine, 106:32-34, January, 1961.

Horita, A., and Weber, L. J. The enzymic dephosphorylation and oxidation of psilocybin by mammalian tissue homogenates. Biochemical Pharmacology, 10:47-54, July, 1961.

Irwin, S. Potential dangers of the hallucinogens. In: Gamage, J.R., and Zarkin, E.L., eds. Hallucinogenic Drug Research: Impact of Science on Society. Beloit, Wisc.: STASH Press, 1970, pp. 27-33.

Isbell, H. Comparison of the reactions induced by psilocybin and LSD-25 in man. Psychopharmacologia, 1:29, 1959.

Isbell, H., Wolbach, A.B.; Wikler, A.; and Miner, E.J. Cross-tolerance between LSD and psilocybin. Psychopharmacologia, 2:147, 1961.

Keeler, M.H. Inter-relations of the effects of psilocybin on subjective sensation, photopic critical frequency of fusion, and circulating non-esterified fatty acids. Experientia, 19:37-38, 1963.

Keeler, M.H. Similarity of schizophrenia and the psilocybin syndrome as determined by objective methods. International Journal of Neuropsychiatry, 1:630-634, December, 1965.

Keeler, M.H. The effects of psilocybin on a test of after-image perception. Psychopharmacologia, 8:131-139, 1965.

Landon, M., and Fischer, R. On similar linguistic structures in creative performance and psilocybin-induced experience. Confinia Psychiatrica, 13:115-138, 1970.

Leary, T. The effects of test score feedback on creative performance and of drugs of creative experience. In: Taylor, C.W. ed. Widening Horizons in Creativity. New York: John Wiley and Sons, 1964.

FILMED FROM BEST AVAILABLE COPY

Leary, T.; Litwin, G.H.; and Metzner, R. Reactions to psilocybin administered in a supportive environment. Journal of Nervous and Mental Disease, 137:561-573, 1963.

Levine, W.G. Formation of blue oxidation product from psilocybin. Nature, 215:1292-1293, September 16, 1967.

Macaulay, E.L.; Burmmett, R.E.; and Dana, G.W. Proceedings of the Western Pharmacology Society, 5:27-33, 1962.

Malitz, S.; Esecover, H.; Wilkens, B.; and Hoch, P.H. Some observations on psilocybin, a new hallucinogen in volunteer subjects. Comprehensive Psychiatry, 1:8-17, February, 1960.

Metzner, R., ed. The Ecstatic Adventure. New York: Macmillan, 1968.

Metzner, R.; Litwin, G.; and Weil, G.M. The relation of expectation and mood to psilocybin reactions: A questionnaire study. Psychedelic Review, 5:3-39, 1965.

Rinkel, M.; Atwell, C.R.; DiMascio, A.; and Brown, J. Experimental psychiatry. V. Psilocybin, a new psychotogenic drug. New England Journal of Medicine, 262:295-297, February 11, 1960.

Robbers, J.E.; Tyler, V.E.; and Ola'h, G.M. Additional evidence supporting the occurrence of psilocybin in panaeolus foenisecii. Lloydia, 32:399-400, September, 1969.

Ruzickova, R.; Bily, D.; Konias, V.; and Soucek, Z. The effect of psilocybin in chronic schizophrenia. Activitas Nervosa Superior, 8:222-223, June, 1966.

Ruzickova, R.; Bily, D.; Vyhnankova, M.; Dubansky, B.; Konias, V.; and Soucek, Z. Clinical effect of psilocybin in chronic schizophrenics. Activitas Nervosa Superior, 8:346-347, November, 1966.

Rynearson, R.R.; Wilson, M.R.; and Bickford, R.G. Psilocybin-induced changes in psychologic function, electroencephlogram, and light-evoked potentials in human subjects. Mayo Clinic Proceedings, 43:191-204, March, 1968.

Stein, S.I. Observation on agarics causing cerebral mycetisms. I. An unusual effect from species of Mexican mushrooms psilocybe cubensis. Mycopathologia, 9:263-267, 1958.

FILMED FROM BEST AVAILABLE COPY

Stein, P.I.; Gloss, G.F.; and Gabel, N.W. Observations on psychoneurophysiologically significant mushrooms. Mycopathologia, 11:205-216, 1959.

Steiner, J.E., and Sulman, F.G. Simultaneous studies of blood sugar, behavioral changes and EEG on the wake rabbit after administration of psilocybin. Archives Internationales de Pharmacodynamie et de Therapie, 145:301-308, October 1, 1963.

Wasson, R.G. The hallucinogenic mushrooms of Mexico and psilocybin: A bibliography. Botanical Museum Leaflets, 73C, March 10, 1965.

Wasson, V.P., and Wasson, R.G. Mushrooms, Russia and History. New York: Pantheon Books, 1957.

Wiseman-Distler, M.H., and Sourkes, T.L. The effect of 4-hydroxyindoles on the metabolism of 5-hydroxytryptamine (serotonin). Annals of the New York Academy of Sciences, 96:143-151, January 13, 1962.

Wooley, D.W., and Campbell, N.K. Serotonin-like and antiserotonin properties of psilocybin and psilocin. Science, 136:777-778, June 1, 1962.

Zsigmond, E.K.; Folders, V.M.; and Folders, F.T. The in vitro inhibitory effect of psilocybin and related compounds on human cholinesterases. Psychopharmacologia, 4:23-28, 1963.

FILMED FROM BEST AVAILABLE COPY

The National Clearinghouse for Drug Abuse Information, operated by the National Institute of Mental Health on behalf of the Special Action Office for Drug Abuse Prevention and the Federal agencies engaged in drug abuse education programs, is the focal point for Federal information on drug abuse. The Clearinghouse distributes publications and refers specialized and technical inquiries to Federal, State, local, and private information resources. Inquiries should be directed to the National Clearinghouse for Drug Abuse Information, P.O. Box 1908, Rockville, Maryland 20850.

FILMED FROM BEST AVAILABLE COPY

NATIONAL CLEARINGHOUSE FOR DRUG ABUSE INFORMATION
P.O. Box 1908, Rockville, Maryland 20850

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF H.E.W.
HEW 396

OFFICIAL BUSINESS
Penalty for private use, $300

AN EQUAL OPPORTUNITY EMPLOYER

NCDAT-20

NOTICE OF MAILING CHANGE

☐ Check here if you wish to discontinue receiving this type of publication.

☐ Check here if your address has changed and you wish to continue receiving this type of publication. (Be sure to furnish your complete address including zip code.)

Tear off cover with address label still affixed and send to:

Printing and Publications Management
National Institute of Mental Health
5600 Fishers Lane (Rm. 6-105)
Rockville, Maryland 20852